The American Midland Naturalist

Founded by J. A. Nieuwland, C.S.C.

Editor
Robert P. McIntosh

Gregory J. Anderson, Storrs, Connecticut ..... Systematic Botany
Albert O. Bush, Brandon, Man., Canada ..... Parasitology
Harald E. Esch, Notre Dame, Indiana ..... Animal Behavior
Arthur W. Ghent, Urbana, Illinois ..... Biological Statistics
Deborah Goldberg, Ann Arbor, Michigan ..... Plant Population Ecology
James F. Lynch, Edgewater, Maryland ..... Animal Ecology
Roy W. McDiarmid, Washington, D.C. ..... Herpetology
Russell K. Monson, Boulder, Colorado ..... Plant Physiology
Samuel C. Mozley, Raleigh, North Carolina ..... Limnology and Hydrobiology
Brent B. Nickol, Lincoln, Nebraska ..... Invertebrate Zoology
William M. Shields, Syracuse, New York ..... Ornithology
Frank Slansky, Jr., Gainesville, Florida ..... Entomology
Roy A. Stein, Columbus, Ohio ..... Ichthyology
Gerald Svendsen, Athens, Ohio ..... Mammalogy
John Vankat, Oxford, Ohio ..... Vegetation Ecology

Vol. 119, 1988
(January, April)

Dates of Publication
No. 1 March 25, 1988
No. 2 June, 1988

PUBLISHED BY THE UNIVERSITY OF NOTRE DAME
NOTRE DAME, INDIANA

CONTENTS

No. 1 January, 1988

Effects of the Quaking Aspen Compounds Catechol, Salicin and Isoniazid on Two Subspecies of Tiger Swallowtails ..... Richard L Lindroth, J. Mark Scriber and M. T. Stephen Hsia 1

Infestation of Solanum carolinense Fruit by Frumenta nundinella: Are Larvae Affected by Interfruit Competition? ..... Bruce Peary Solomon 7

The Effect of Host-plant Density on the Numbers of Mexican Bean Beetles Epilachna varivestis ..... P. Turchin 15

Abundance and Diversity of Surface-active Collembola along a Watershed in the Northern Chihuahuan Desert ..... Steven J. Loring, Danforth C. Weems and Walter G. Whitford 21

Spatial and Temporal Variation in the Abundance and Diversity of Ants (Hymenoptera: Formicidae) in the Soil and Litter Layers of a Maryland Forest ..... James F. Lynch, Alexander K. Johnson and Edward C. Balinsky 31

Influence on Larval Growth of the Eastern Black Swallowtail Butterfly Papilio polyxenes (Lepidoptera: Papilionidae) of Seasonal Changes in Nutritional Parameters of Umbelliferae Species ..... Mark D. Finke and J. Mark Scriber 45

Solitary and Gregarious Brooding, Sex Ratios and the Incidence of Thelytoky in the Parasitic Hymenoptera ..... Howard V. Cornell 63

Interactions of a Parasite, Bracon hebetor (Hymenoptera: Braconidae), and a Predator, Xylocoris flavipes (Hemiptera: Anthocoridae), with Populations of Tribolium castaneum and Plodia interpunctella ..... Piotr Kraszpulski and Robert Davis 71

Resistance to Beet Armyworms (Spodoptera exigua) Induced by Exposure to Spider Mites (Tetranychus turkestani) in Cotton ..... Richard Karban 77

Alternative Male Mating Tactics in a Thrips: Effects of Sex Ratio Variation and Body Size ..... Bernard J. Crespi 83

Aspects of the Life History of the Southern Red-back Salamander Plethodon serratus Grobman in the Southeastern United States ..... Carlos D. Camp 93

Geographic Variation in the Mating Call of the Green Treefrog Hyla cinerea ..... Adam Asquith, Ronald Altig and Paul Zimba 101

Occurrence of Glochidia in Stream Drift and on Fishes of the Upper North Fork Holston River, Virginia ..... Richard J. Neves and James C. Widlak 111

Fruit Consumption by Birds in Relation to Fat Content of Pulp ..... Victoria A. Borowicz 121

Dynamics of Habitat Use by Small Mammals in Prairie Communities ..... Ellen J. Snyder and Louis B. Best 128

Sex in Ephedra trifurca (Ephedraceae) with Relation to Chihuahuan Desert Habitats ..... James W. Brunt, Marsha R. Conley and Gary L. Cunningham 137

Effects of Clear-cut Logging on Wood Breakdown in Appalachian Mountain Streams ..... S. W. Golladay and J. R. Webster 143

Hickory (Carya spp.) Distribution and Replacement in a Second-growth Oak Hickory Forest of Southeastern Ohio ..... Brian C. McCarthy and Warren A. Wistendahl 156

The Ecological Life Cycle of Cryptotaenia canadensis (L.) DC. (Umbelliferae), a Woodland Herb with Monocarpic Ramets ..... Jerry M. Baskin and Carol C. Baskin 165

Differential Establishment of Pinyon and Juniper Following Fire ..... Robin J. Tausch and Neil E. West 174

Effect of Salinity on Leaf Ionic Content and Photosynthesis of Taxodium distichum L. ..... S. R. Pezeshki, R. D. DeLaune and W. H. Patrick, Jr. 185

Effects of Pollen Source and Time of Pollination on Seed Production and Seed Weight in Phacelia dubia and P. maculata (Hydrophyllaceae) ..... Foster Levy 193

Localized Ice Storm Damage in an Appalachian Plateau Watershed ..... R. E. J. Boerner, Shari D. Runge, Do-Soon Cho and James G. Kooser 199

Notes and Discussion

On Measuring Vegetation Characteristics in Bird Territories: Nest Sites vs. Perch Sites and the Effect of Plot Size ..... Kenneth E. Petit, Daniel R. Petit and Lisa J. Petit 209
Mound Structure in Three Taxa of Mexican Kangaroo Rats (Dipodomys spectabilis cratodon, D. s. zygomaticus and D. nelsoni) ..... Troy L. Best, Clare Intress and Karen D. Shull 216

CONTENTS
No. 2 April, 1988

Foraging Behavior and Switching by the Grasshopper Sparrow Ammodramus savannarum Searching for Multiple Prey in a Heterogeneous Environment .. .. Anthony Joern 225
Avian Consumption of the Fruit of the Cacti Stenocereus eichlamii and Pilosocereus maxonii in Guatemala ..... Peter W. Wendelken and Robert F. Martin 235
Morphologic Variation in the Spotted Bat Euderma maculatum .... Troy L. Best 244
Drought and Survival in a Self-perpetuating Pinus pungens Population: Equilibrium or Nonequilibrium? ..... Lawrence S. Barden 253
Population Structure and Biomass Allocation of the Naturalized Shrub Lonicera maackii (Rupr.) Maxim. in Forest and Open Habitats ..... James O. Luken 258
Population Dynamics of an Herbaceous Perennial Danthonia spicata during Secondary Forest Succession ..... Samuel M. Scheiner 268
Response of Herb Layer Cover to Experimental Canopy Gaps ..... B. S. Collins and S. T. A. Pickett 282
Demography of the Hellbender Cryptobranchus alleganiensis in the Ozarks ..... Chris L. Peterson, Dean E. Metter, Brian T. Miller, Robert F. Wilkinson and Milton S. Topping 291
Herbivory and Species Replacement in the West Coast Searockets (Cakile, Brassicaceae) ..... Robert S. Boyd 304
Genetics of Color Expression in the Spider Enoplognatha ovata (Araneae:Theridiidae) from Coastal Maine ..... Paul R. Reillo and David H. Wise 318
Aquatic Microannelids (Oligochaeta and Aphanoneura) of Underground Waters of Southeastern New York ..... David Strayer and Eileen Bannon-O'Donnell 327
Effects of Different Patterns of Supplemental Water and Nitrogen Fertilization on Productivity and Composition of Chihuahuan Desert Annual Plants. ..... Julio R. Gutierrez, Oswaldo A. Da Silva, Maria I. Pagani, Danforth Weems and Walter G. Whitford 336
Diel Emergence, Swarming and Longevity of Selected Adult Aquatic Insects from a Sonoran Desert Stream ..... John K. Jackson 344
Abundance, Distribution and Life Cycles of Midges (Chironomidae: Diptera) in an Acid Strip-mine Lake in Southern Illinois ..... Steven J. Zullo and John B. Stahl 353
Use of Multivariate Discriminant Analysis of Male Wing Morphometrics to Delineate a Hybrid Zone for Papilio glaucus glaucus and P. g. canadensis in Wisconsin ..... Heidi J. Luebke, J. Mark Scriber and Brian S. Yandell 366
Experimentally Induced Density-dependent Mating Patterns in Phyllobius maculicornis Germ. (Coleoptera: Curculionida) ..... Folke K. Larsson 380
Vulnerability of Acorn Weevils (Coleoptera: Curculionidae) and Attractiveness of Weevils and Infested Quercus alba Acorns to Peromyscus leucopus and Blarina brevicauda ..... Brad Semel and Douglas C. Andersen 385
Disease and Population Declines in the Flattened Musk Turtle Sternotherus depressus ..... C. Kenneth Dodd, Jr. 394

Spatial and Temporal Availability of Floodplain Habitat: Long-Term Changes at Pool 19, Mississippi River ..... Jack W. Grubaugh and Richard V. Anderson 402
Small Male Advantage in Mating in Parapediasia teterrella and Agriphila plumbifimbriella (Lepidoptera: Pyralidae) ..... Larry D. Marshall 412
Gender Dimorphism in Growth and Mass Partitioning by Box-elder (Acer negundo L.) ..... Paul F. Ramp and Stephen N. Stephenson 420

Notes and Discussion

Myrmecochory in the Introduced Range Weed, Leafy Spurge (Euphorbia esula L.) ..... Robert W. Pemberton 431
Size Variation in Coptotermes formosanus Shiraki (Rhinotermitidae): Consequences of Host Use ..... Deborah A. Waller and Jeffery P. La Fage 436
Predation by Paragnetina fumosa (Banks) (Plecoptera: Perlidae) on Mayflies: The Influence of Substrate Complexity ..... Kurt W. Pontasch 441

AUTHOR INDEX

Altig, Ronald 101
Andersen, Douglas C. 385
Anderson, Richard V. 402
Asquith, Adam 101

Balinsky, Edward C. 31
Bannon-O'Donnell, Eileen 327
Barden, Lawrence S. 253
Baskin, Carol C. 165
Baskin, Jerry M. 165
Best, Louis B. 128
Best, Troy L. 216, 244
Boerner, R. E. J. 199
Borowicz, Victoria A. 121
Boyd, Robert S. 304
Brunt, James W. 137

Camp, Carlos D. 93
Cho, Do-Soon 199
Collins, B. S. 282
Conley, Marsha R. 137
Cronell, Howard V. 63
Crespi, Bernard J. 83
Cunningham, Gary L. 137

Da Silva, Oswaldo A. 336
Davis, Robert 71
De Laune, R. D. 185
Dodd, C. Kenneth, Jr. 394

Finke, Mark D. 45

Golladay, S. W. 143
Grubaugh, Jack W. 402
Gutierrez, Julio R. 336

Hsia, M. T. Stephen 1

Intress, Clare 216

Jackson, John K. 344
Joern, Anthony 225
Johnson, Alexander K. 31

Karban, Richard 77
Kooser, James G. 199
Kraszpulski, Piotr 71

La Fage, Jeffrey P. 436
Larsson, Folke K. 380
Levy, Foster 193
Lindroth, Richard L. 1
Loring, Steven J. 21
Luebke, H. J. 366
Luken, James O. 258
Lynch, James F. 31

Marshall, Larry D. 412
Martin, Robert F. 235
McCarthy, Brian C. 156
Metter, Dean E. 291
Miller, Brian T. 291

Neves, Richard J. 111

Pagani, Maria I. 336
Patrick, W. H., Jr. 185
Pemberton, Robert W. 431
Peterson, Chris L. 291
Petit, Daniel R. 209
Petit, Kenneth E. 209
Petit, Lisa J. 209
Pezeshki, S. R. 185
Pickett, S. T. A. 282
Pontasch, Kurt W. 441

Ramp, Paul F. 420
Reillo, Paul R. 318
Runge, Shari D. 199

Scheiner, Samuel M. 268
Scriber, J. Mark 1, 45, 366
Semel, Brad 385
Shull, Karen D. 216
Snyder, Ellen J. 128
Solomon, Bruce Peary 7
Stahl, John B. 353
Stephenson, Stephen N. 420
Strayer, David 327

Tausch, Robin J. 174
Topping, Milton S. 291
Turchin, P. 15

Waller, Deborah A. 436
Webster, J. R. 143
Weems, Danforth 23, 336
Wendelken, Peter W. 235
West, Neil E. 174
Whitford, Walter G. 21, 336
Widlak, James C. 111
Wilkinson, Robert F. 291
Wise, David H. 318
Wistendahl, Warren A. 156

Yandell, Brian S. 366

Zimba, Paul 101
Zullo, Steven J. 353

SUBJECT INDEX

Acer negundo, gender dimorphism 420
Agriphila plumbifimbriella, small male advantage 412
Alabama, population of flattened musk turtle 394
Ammadramus savannarum, foraging behavior 225
Amphibians, green treefrog 101
hellbender demography 291
red-backed salamander 93
Appalachian Plateau, ice storm damage to forest 199
Arizona, aquatic insects in desert stream 344

Behavior, foraging by grasshopper sparrow 225
male mating in thrips 83
variation in treefrog mating call 101
Birds, foraging behavior 225
fruit consumption 121, 235
territory and vegetation 209
Blarina brevicauda, prey on acorn weevils 385
Bracon hebetor, interaction with predator 71

Cakile maritima and *C. edentula*, herbivory on and replacement 304
Chihuahuan Desert, annual plants 326
collembola 21
sex in *Ephedra trifurca* 137
Coevolution, trembling aspen and tiger swallowtail 1
Coptotermes formosanus, size variation 436
Cornus amomum and *C. racemosa*, fruit consumption by birds 121
Cryptobranchus alleganiensis, demography 291
Cryptotaenia canadensis, life cycle 165

Danthonia spicata, population dynamics 268
Dipodomys spectabilis and *D. nelsoni*, mound structure 216
Diversity, ants in forest 31
Collembola in desert 21

Ecology, animal, ant diversity in forest 31
demography of hellbender 291
density-dependent mating in *Phyllobius maculicornis* 380
floodplain fishes 402
foraging behavior of grasshopper sparrow 225
fruit consumption by birds 21, 235
habitat use by small mammals 128
herbivory on *Cakile* 304
microannelids of underground waters 327
morphologic variation in spotted bat 244
mound structure in *Dipodomys* 216
small mammals prey on acorn weevils 385
territoriality in birds 209
population decline in flattened musk turtle 394

Ecology, plant, ant diversity in forest...31
cactus fruit consumed by birds.....235
Cornus fruit consumed by birds.....121
establishment of pinyon-juniper after fire.....174
gender dimorphism in box-elder....420
herbivory on *Cakile*.....304
hickory in second growth forest....156
ice storm damage to forest.....199
myrmecochory in leafy spurge.....431
pattern of *Ephedra trifurca*.....137
pollination in *Phacelia*.....193
population and biomass of *Lonicera maackii*.....258
population dynamics of *Danthonia spicata*.....268
response of herb cover to canopy gaps.....282
salinity effects on bald cypress.....185
survival of *Pinus pungens* in drought .253
water and fertilization effects on desert annuals.....336
Elaphrothrips tuberculatus, male mating...83
Enoplognatha ovata, genetics of color expression.....318
Ephedra trifurca, sex in.....137
Epilachna varivestis, effect of host-plant density.....15
Euderma maculata, morphologic variation.....244
Euphorbia esula, myrmecochory in.....431

Fishes, floodplain of Mississippi River.....402
glochidia on.....111
Frugivory, birds on cactus.....235
birds on *Cornus*.....121
Frumenta nundinella, intraspecific competition.....7

Genetics, color expression in spider...318
Georgia, parasite and predator interactions on insect pests of stored grain.....71
salamander life history.....93
Guatemala, cactus fruit consumed by birds.....235

Hyla cinerea, mating call.....101
Hylocichla mustelina, vegetation and territory.....209

Illinois, midges in strip-mine lake....353
Indiana, effects of interfruit competition on larvae.....7
small mammals prey on acorn weevils.....385

Insects, ants in forest.....31
density-dependent mating in *Phyllobius maculicornis*.....380
effects of host-plant density on Mexican bean beetles.....15
effects of interfruit competition on larvae.....7
effects of secondary compounds on butterflies.....1
effects of umbellifer on larval growth.....45
emergence of aquatic insects.....344
hybrids of *Papilio glaucus* subspecies .366
mating in a thrips.....83
midges in strip mine lake.....353
myrmecochory in leafy spurge.....431
parasite and predator interaction on insect pests of stored grain.....71
small male advantage in moths.....412
small mammals prey on acorn weevils.....385
predation on mayflies.....441
resistance of cotton to beet armyworm induced by mite.....77
size variation in termites..... 436
surface-active collembola.....15
thelytoky in parasitic Hymenoptera..63
Invertebrates (other than insects), color expression in spider.....318
microannelids of underground waters.....327
Iowa, floodplain habitat of Mississippi River.....402

Juniperus osteosperma, establishment after fire.....174

Kentucky, life cycle of *Cryptotaenia canadensis*.....165
population and biomass of *Lonicera maacki*.....258

Lakes, midges in acid strip-mine lake .353
Lonicera maackii, population and biomass.....258
Louisiana, size variation in termites ..436

Maine, color expression in spider.....318
Mammals, habitat use in prairie.....128
morphologic variation in spotted bat.....244
mound structure in *Dipodomys*.....116
prey on acorn weevils.....385
Maryland, ants in forest.....31
Mexico, mound structure in *Dipodomys*.....216

Michigan, gender dimorphism in box-elder 420
male mating in thrips....83
population dynamics of *Danthonia spicata*....268
Minnesota, habitat use by small mammals....128
Montana, myrmecochory in leafy spurge....431
Myrmecochory, in leafy spurge....431

Nebraska, foraging behavior of grasshopper sparrow....225
New Mexico, Collembola....21
sex in *Ephedra trifurca*....137
small male advantage in moths....412
water and fertilizer effects on desert annuals....336
New York, microannelids of underground waters....327
North Carolina, effects of clear-cut logging on wood breakdown in streams....143
effect of host-plant density on Mexican bean beetles....15
survival of drought by *Pinus pungens* 253

Ohio, hickory in second-growth forest 156
ice storm damage to forest....199
umbellifer effects on butterfly....45
vegetation and territoriality in birds 209
Ozark Mountains, demography of hellbender....291

Papilio glaucus, effects of secondary compounds....1
hybrids....266
Papilio polyxenes, umbellifer effects on larval growth....45
Paragnetina fumosa, predation on mayflies....441
Parapediasia teterella, small male advantage....412
Parasites, glochidia in drift and on fishes....111
Pennsylvania, fruit consumption by birds....121
response of herb cover to canopy gaps....282
Peromyscus leucopus, prey on acorn weevils....385
Phaseolus vulgaris, effect of density on Mexican bean beetles....15
Phacelia dubia and *P. maculata*, pollination and seed....193
Phyllobius maculicornis, mating....380

Physiology, plant, salinity effects on bald cypress....185
Pilosocereus maxonii, birds consume fruit....235
Pinus monophylla, establishment after fire....174
Pinus pungens, survival in drought....253
Plethodon serratus, life history....93
Plodia interpunctella, control by parasite and predator....7
Populus tremuloides, effects of secondary compounds on butterflies....1
Prairie, habitat use by small mammals 128
Predation, on mayflies....441
small mammals on acorn weevils...385
foraging behavior and switching of bird....225

Quercus alba, acorn weevils....385

Reproduction, mating in moths....412
pollination and seed of *Phacelia*....193
Reptiles, disease of flattened musk turtle....394

Secondary compounds, effects on butterflies....1
Solanum carolinense, herbivory....7
Sonoran Desert, emergence of aquatic insects....344
Spodoptera exigua, resistance of cotton induced by mite....77
Stenocereus eichlani, birds consume fruit 235
Sternotherus depressus, population decline and disease....394
Streams, aquatic insects....344
effects of clear-cut logging....143
floodplain of Mississippi River....402
glochidia in drift....111
hellbender demography....291
Sweden, density-dependent mating in *Phyllobius maculicornis*....380

Taxodium distichum, salinity effects on photosynthesis....185
termites on....436
Tetranychus turkestani, induced resistance of cotton to beet armyworm....77
Thelytoky in parasitic Hymenoptera...63
Tribolium castaneum, control by parasite and predator....71

Virginia, glochidia in drift and on fishes....111
predation on mayflies....441

Wilsonia citrina, territory 209
Wisconsin, effects of secondary compounds on butterflies.....1
hybrids of *Papilio glaucus* subspecies 366
Xylocoris flavipes, interaction with parasite 71